TECHNICAL REVIEW AND EVALUATION OF TITLE V APPLICATION FOR
Seligman Compressor Station

PERMITTEE: El Paso Natural Gas Company
AIR QUALITY PERMIT NO. 1000158
DATE: 6/4/97

REMARK NUMBER	REMARKS	RECVD BY
1.	This application is submitted for renewal of existing operating permit #M251199-96 for El Paso's Seligman Compressor Station.	AH1
2.	The facility is located at Seligman, Yavapai County. ADEQ has jurisdiction over this source.	
3.	El Paso operates one GE Frame 3 turbine for natural gas transmission. No control equipment are used to control emissions from burning natural gas.	
4.	An operating permit (#M251199-96) was issued on August 16, 1993.	
5.	The GE turbine was installed in 1966 and uprated by 262 hp in 1991.	
6.	Performance tests have been conducted on this turbine for emissions of NOx and CO. At all times, the tested values were below the allowable limits.	
7.	The Seligman compressor station has to date no records of any violation.	

TECHNICAL REVIEW OF PERMIT NUMBER 1000158
(El Paso Natural Gas Company, Seligman Compressor Station)

General Comments

El Paso Natural Gas Company (EPNG) provides natural gas transportation services for natural gas suppliers and end users throughout the southwestern United States. EPNG owns and operates a large pipeline network for which the Seligman Compressor Station serves as one of the gas compression locations. Compression is needed to maintain enough pressure in the pipeline to keep the gas flowing through the pipeline and is accomplished by two synchronous electric driven motors and a natural gas fired turbine. Because this turbine has been automated, Seligman is an unattended location.

The Seligman station operates one gas turbine and two synchronous electric driven motors to drive the compressor units. The gas turbine is a GE regenerative cycle gas turbine. The gas turbine is powered by the combustion of natural gas. The gas turbine stack is the primary source of air pollutant emissions. The primary pollutant present in the stack gases, resulting from combustion of natural gas, is NOx. Formaldehyde, SO_2, CO, and VOCs are other trace pollutants present in the stack gases. Other equipment on site is comprised mainly of valves, compressor seals, connections and associated piping, and emissions from these units are mainly trace amounts of VOCs.

Regulatory History

Permits:

Though the GE Frame 3 turbine of the Seligman station has been operating for a few decades, the first air quality permit was an installation permit (Permit # 55029) issued to them in 1991. This permit was to conduct a "screwdriver uprate" of the Seligman simple cycle turbine. The uprate consisted of engineering work to develop new turbine documentation and manually resetting the turbine's firing temperature resulting in an increase in the turbine's horsepower from 6450 to 6692 site horsepower. The most relevant conditions of this permit are:

1. EPNG shall install this 242 hp uprate of a GE model 32GS turbine in compliance with A.A.C. R18-2-502, 801.1, and 801.36 (40 CFR 60 Subparts A and GG).

2. On and after the date of startup of the uprated GE Model 32GS turbine, EPNG shall not discharge or cause the discharge into the atmosphere from the stack the following pollutants in excess of the following specified limits:

$$STD = (0.015 (14.4/Y) + F).$$

3. Performance tests for NOx shall be conducted once every three years, at least 30 days prior to the anniversary date of this permit.

An operating permit was issued in 1993 that included the conversion from simple cycle turbine to regenerative turbine in 1990. The second permit number is M251199-96. The most relevant conditions of this permit are:

1. Permittee shall operate the GE Frame 3, model 32GR in accordance with R18-2-502, R18-2-801.1 and R18-2-801.36 (40 CFR 60, Subpart A and GG).
2. On and after the date of startup, EPNG shall not cause to be discharged into the atmosphere from the stack, any gases which exhibit greater than 40 percent opacity.
3. The total emissions of air contaminants from any of the sources shall not exceed the values stated on Attachment "C" entitled "Emission Sources - maximum allowable emission rates." (This was based on 8760 hours of operation and is simply the potential to emit. This is no longer included in the operating permits.)
4. EPNG shall conduct or cause to be conducted annual performance testing on the turbine at the natural gas compressor station for NOx and CO.
5. EPNG is permitted to burn natural gas in the turbine. EPNG shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine on a daily basis.

Correspondence from ADEQ (AQD:OAQ:CU:8660) to the source waives the requirements for NOx limit since the installation of the regenerator converts the turbine from simple cycle to regenerative cycle. A modification is "any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies" subject to certain exemptions. The uprate with ***no capital expenditure*** is clearly not a modification (40 CFR 60.14.e(2)). After a review of the current permit application, ADEQ has determined that the NSPS requirements for the GE turbine at the Seligman compressor station have been incorrectly applied to the unit in the past. Here's a brief description:

> The GE Frame 3 gas turbine was installed in 1966 as a simple cycle turbine and as such was not subject to the provisions of any of the new source performance standards (NSPS). In 1990, EPNG installed a regenerator on the Seligman turbine. Installation of the regenerator converted the turbine from simple cycle to regenerative cycle as defined in 40 CFR 60.331 and is estimated to have increased NOx emissions. However, regenerative turbines of less than 107.2 gigajoules per hour, as is the case at Seligman, are exempt from NOx requirements pursuant to 40 CFR 60.332(l). Therefore, because there was no increase in emission of a pollutant <u>subject to an NSPS standard</u>, no NSPS modification occurred pursuant to 40 CFR 60.14(a). Similarly, no reconstruction as defined in 40 CFR 60.15 occurred. DEQ therefore determined that Subpart GG was not applicable.
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> Though the GE Frame 3 turbine of the Seligman station had been operating for a few decades, the first air quality permit was an installation permit (Permit # 55029) issued to them in 1991. This permit was to conduct a "screwdriver uprate" of the Seligman simple cycle turbine. The uprate consisted of engineering work to develop new turbine documentation and manually resetting the turbine's firing temperature resulting in an increase in the turbine's horsepower from 6450 to 6692 site horsepower.

In the technical support document for the installation permit no. 55029 to uprate the turbine by 292 hp, the permit engineer has stated the following in support of including the NSPS requirements:

"El Paso Station (was) originally constructed (in) 1959. But this modification is not part of a continues program of construction or modification. Therefore, (it is a) modification (since) construction commences after 1982."

In the technical support document for operating permit no. M251199-96, the permit engineer has stated the following in support of including the NSPS requirements:

"40 CFR 60, Subpart GG is applicable because this source is rated at 58.63 MM Btu/hr which is greater than 10 MM Btu/hr (the lower limit for NSPS applicability) and was reconstructed in 1991, which is later than October 3, 1977."

However, a modification is "any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies" subject to certain exemptions. The "screwdriver" uprate with no capital expenditure is not a modification and is exempted under 40 CFR 60.14.e(2). Also, regenerative turbines of less than 107.2 gigajoules per hour, as is the case at Seligman, are exempt from NOx requirements pursuant to 40 CFR 60.332(l). Therefore, because of there was no increase in a pollutant subject to an NSPS standard, no NSPS modification occurred pursuant to 40 CFR 60.14(a). The uprate is also not a reconstruction as defined in 40 CFR 60.15.

Based on the above discussion, ADEQ has concluded that the turbine is not subject to NSPS and hereby is removing the NSPS Subpart GG requirements through this Part 70 renewal process.

Testing:

Several performance tests have been conducted in the last seven years. The source has been in compliance as indicated by the results of these performance tests. The latest test performed on 2/4/97 gave the following results:

Test Date	Source	NOX (ppm)	CO (ppm)
February 7, 1997	GE Frame 3	75.1	2.0

Emissions

The potential emissions reported in the Title V permit application are as follows:

NOX: 153.74 tpy

CO: 3.04 tpy
VOC: 0.69 tpy
SO_2: 0.14 tpy
Formaldehyde: 2.75 tpy

These emission rates were based on emission factors (e.g. AP-42), theoretical stoichiometric considerations and 8760 hours of operation per year. They have also reported test data based on testing carried out in 1991- 1997. The measured hourly emission rates when multiplied with the actual hours of operation in 1994 give the following actual emissions for that year:

NOX: 113.37 tpy (test data, actual hours)
CO: 2.26 tpy (test data, actual hours)
VOC: 0.51 tpy (test data, factors, actual hours)
SO_2: 0.10 tpy (emission factors, actual hours)
Formaldehyde: 2.03 tpy (emission factors, actual hours)

The emissions inventory (EI) for the year 1994, submitted to the Arizona Department of Environmental Quality (ADEQ) reported the following emissions:

Pollutant	Actual Emissions in 1994
1995 Emissions Reported from EPNG Seligman Station	
CO	6.99
NOx	120.76
SO2	0.10
VOC	0.15

Permit Contents : Attachment B

The GE Frame 3 gas turbine was installed in 1966 as a simple cycle turbine and as such was not subject to the provisions of any of the new source performance standards (NSPS). A regenerator was added in 1990 that changed the turbine from a simple cycle to a regenerative cycle. However, in 1991, when the turbine was uprated by 242 hp, NSPS requirements were added to the installation permit. Finally, in 1993, the operating permit issued reflected the change in the turbine from simple cycle to regenerative cycle. However, NSPS requirements were still imposed. The change renders the NSPS requirements for NOx inapplicable. Therefore, the GE regenerative turbine is covered by the state rule; *R18-2-719: Standards of performance for existing stationary rotating machinery*. This state rule considers emissions of three pollutants (I) particulate matter, (ii) visible emissions, and (iii) sulfur dioxide. There is no reference to NOx or CO emissions.

<u>Emission Limits/Standards</u>

A. *GE Regenerative Gas Turbine*

Natural gas combustion results in negligible particulate matter emissions. The maximum potential particulate emissions from the gas turbine at the Seligman station was calculated to be 3.5 tpy. The emissions standard in R18-2-719.C imposes a particulate matter emissions limit of 98.8 tpy. The operating permit requires EPNG to combust only natural gas for turbine operations.

The sulfur standard in R18-2-719.F refers to low sulfur fuel *oils*, therefore this standard is not applicable to natural gas combustion. R18-2-719.I and R18-2-719.J require recordkeeping and reporting requirements of fuel sulfur quantity. These requirements support the aforementioned sulfur standard, and as such are not applicable to natural gas combustion. The visible emissions standard, R18-2-719.E, imposes a 40% opacity limitation.

B. *Non-point sources*

The standards in Article 6 are applicable requirements for non-point sources. The following sources will be monitored:

1. Driveways, parking areas, vacant lots
2. Unused open areas
3. Open areas (Used, altered, repaired, etc.)
4. Construction of roadways
5. Material transportation
6. Material handling
7. Storage piles
8. Stacking and reclaiming machinery at storage piles

All of these areas must comply with the opacity limitation of 40%. The control measures for these sites include gravel for driveways(1) and native vegetation for unused open areas(2). Most of the other sources require control measures of dust suppressants and/or wetting agents(3-8). Material transportation and storage piles also include covering the material (5 and 7), while stacking and reclaiming includes minimizing fall distance (8).

EPNG has indicated in the application, that rare instances of open burning may occur. The condition in the permit directs EPNG to obtain a permit from ADEQ, or the local officer in charge of issuing burn permits.

C. *Other Periodic Activities*

Abrasive Blasting

EPNG has indicated in the permit application that there might be a few occasions on which abrasive blasting activities are conducted on-site. R18-2-726 and R18-2-702 (B) are applicable requirements, and as such have to be included in the permit.

Spray Painting

EPNG has indicated in the permit application that there might be a few occasions on which spray painting activities are conducted on-site. R18-2-727 and R18-2-702(B) are applicable requirements, and as such, have to be included in the permit. R18-2-727(A) and R18-2-727(B) are included in the approved State Implementation Plan (SIP). R18-2-727(C) and R18-2-727(D) are also a part of the approved SIP. They are present in the definitions section of the SIP as R9-3-101.117. EPA approved SIP provision R9-3-527.C is not present in the amended rule. However, R9-3-527.C is an applicable requirement, and is federally enforceable till the current State SIP is approved by the EPA.

Mobile Sources

EPNG has indicated in the permit application that there might be a few occasions on which "mobile source" activities are conducted. "Mobile sources" refer to those sources covered by Article 8. R18-2-801, R18-2-802, and R18-2-804 are applicable requirements, and as such, have to be included in the permit. Portable sources as defined in A.A.C. R18-2-101.84 are not mobile sources.

Monitoring and Recordkeeping Requirements

A. *Regenerative Gas Turbines*

As noted in the preceding discussion under emission limits and standards, natural gas combustion results in minimal particulate matter emissions. It was therefore decided that even though an emission standard exists for particulate matter, it would be unnecessary and impractical to have a rigorous monitoring schedule for the particulate standard. For similar reasons, it was decided that a monitoring schedule for opacity would not be required.

"Pipeline-quality" natural gas has to conform to standards approved by the Federal Energy Regulatory Commission (FERC). One of the FERC standards limits the sulfur content in the gas to less than 5 grains/100 scf (which is equivalent to 0.017 weight percent of sulfur). Another standard specifies that the heating value be greater than or equal to 967 Btu per cubic foot. EPNG runs the gas turbines with fuel drawn from their pipeline, and therefore it was decided that maintaining a copy of the FERC approved Tariff agreement on-site would be an adequate means of complying with the monitoring requirements for the particulate, opacity and fuel use standards.

The permit requires the source to monitor the dates of operation of the turbine.

B. *Non-point Sources*

The specific non-point sources are listed in the above section. Monitoring and recordkeeping requirements for driveways (1) includes maintaining the gravel, and keeping a log of dates new gravel is added. Unused open areas (2) includes a monthly status of the areas and dates fresh vegetation was added. All other non-point sources (3-8) require a record of the date and type of activity performed, and the type of controls used. Also, monitoring requirements for the applicable open burning rule may be satisfied by keeping all open burn permits on file.

C. *Other Periodic Activities*

Other applicable rules are abrasive blasting, spray painting and "mobile source" activities. It was decided to prescribe minimal monitoring requirements.

Reporting Requirements

The permittee is being required to report any change in the FERC approved tariff agreement relating to the sulfur content and the lower heating value of the fuel. The permittee is also required to submit, along with the semi-annual compliance certifications, the dates of operation of the GE gas turbine.

Testing Requirements

A. *GE Regenerative Turbine*:

The source has been required to conduct or cause to be conducted performance test on its GE Frame 3 gas turbine engine for nitrogen oxides. The permittee has been required to conduct this performance test within six months prior to permit expiration for NOx once when the turbine is operated for more than 15 cumulative days during the course of the permit. This testing is required for the purpose of PSD review.

List of Special Provisions

In their application, EPNG provided a list of special provisions that they wanted to be addressed in the permit. This list is located in Tab 1 of the application. They have been addressed in the following manner: Maintenance and Inspection (Item 1), Emergency Shut Down Systems (Item 3), Cathodic protection system (Item 4), General Maintenance & Construction Activities (Item 6), Start-up, Shutdown & Maintenance (Item 8), Insignificant Activities (Item 9), Portable Sources (Item 12)

It was decided that each of these items qualified for classification as an insignificant activity, and as such was included in the list in Attachment "E".

Hazardous Air Pollutants (Item 2): Refer to Sections VI and X, Attachment "A".

Abrasive Blasting (Item 5): Abrasive blasting activities have an applicable requirement in the Arizona Administrative Code AAC). Also, according to the definition in AAC R18-2-101.54, for an activity to be classified as insignificant, it should not have *any* applicable requirement. All projects have to comply with the requirements of R18-2-726 and R18-2-702(B). Refer to Attachment B, I.C.1 and II.C.1.

Spray Painting (Item 7): A similar argument as in Item 5 above provides the reason for including R18-2-726 as an applicable requirement. Refer to I.C.2 and II.C.2.

Emissions Trading (Item 10): ADEQ has determined that EPNG should apply for a permit revision (if necessary) in case there are any changes in the permitted equipment.

Location of records (Item 11): Refer Section II.B, Attachment “B”.

Air Conditioners (Item 13): Refer to Section XXI, Attachment "A".

Asbestos (Item 14): Refer to Attachment “C”.

Performance Tests (Item 15): Refer to Section VI, Attachment "B".